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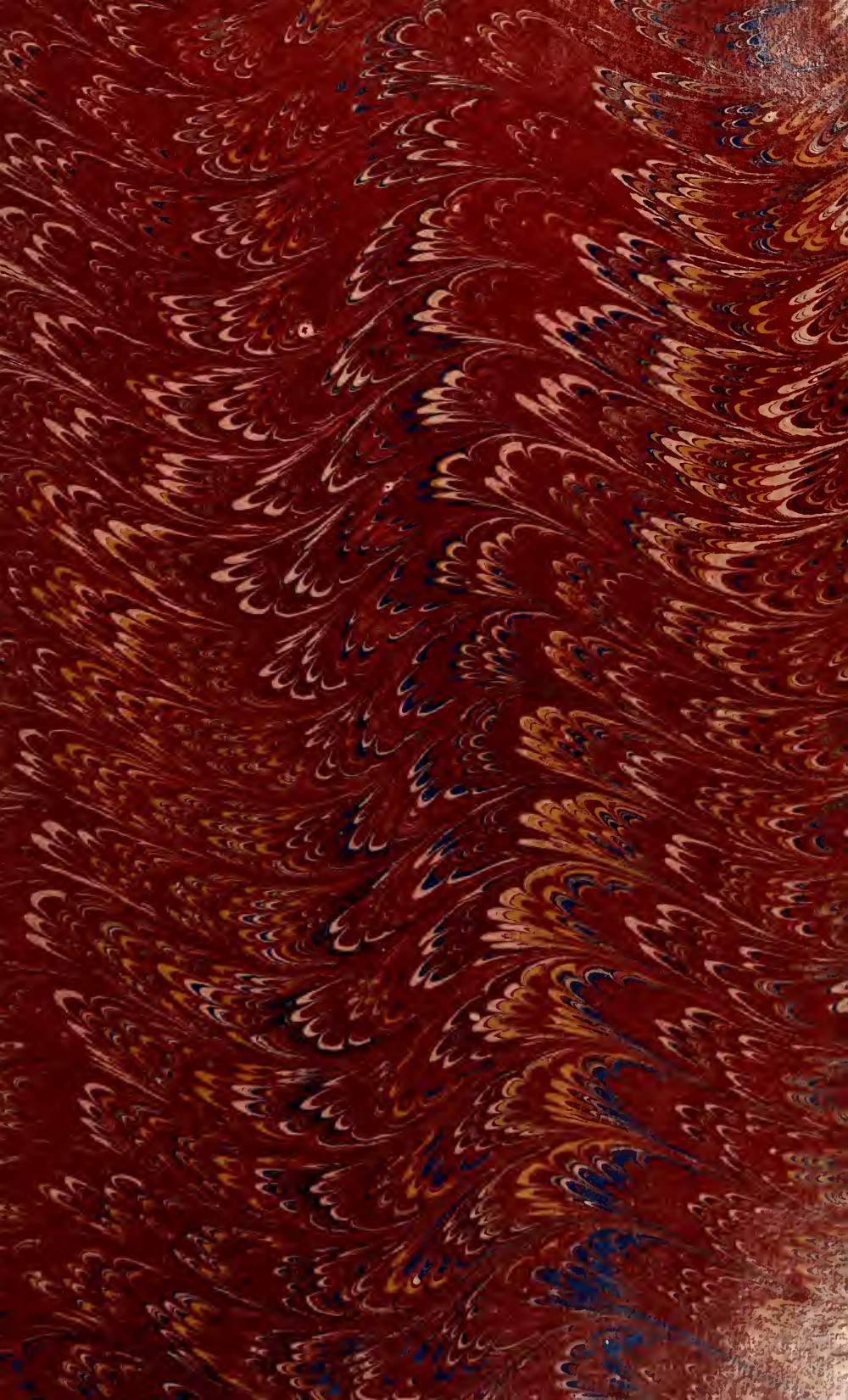
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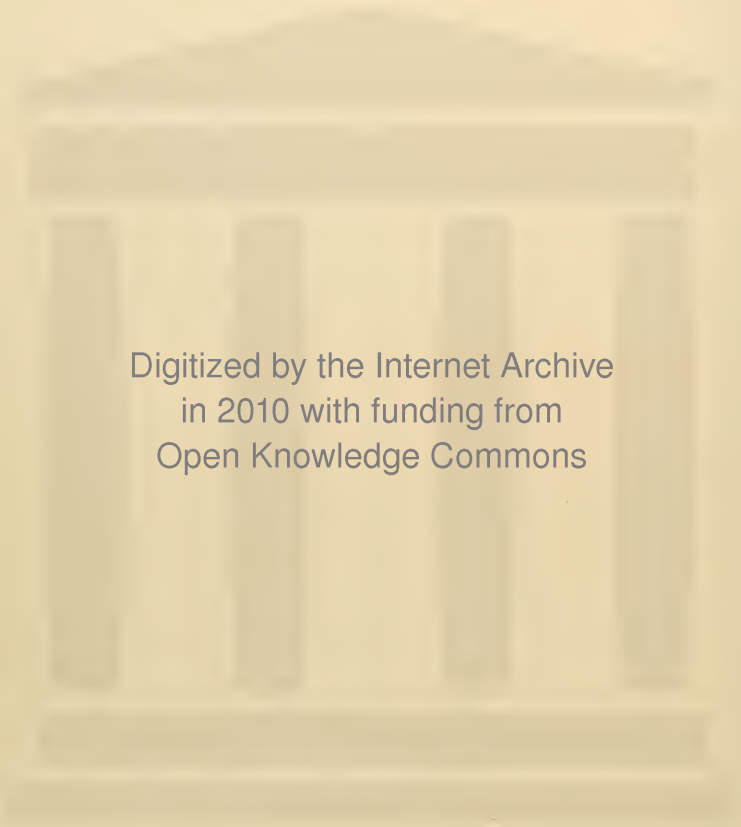
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HAY FEVER

BY

MORELL MACKENZIE, M.D.

ONE SHILLING.

HAY FEVER

Its Etiology and Treatment

A LECTURE

DELIVERED AT THE

LONDON HOSPITAL MEDICAL COLLEGE

(Reprinted from the "British Medical Journal")

BY

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GENTLEMEN,—

The subject I have to bring under your notice to-day is Hay Fever, a complaint which, though not dangerous to life, causes at certain times suffering of so intense a character as to prevent some people following their ordinary avocations, and to render a still larger number, who are not actually disabled, thoroughly miserable during the most agreeable season of the year.

The affection has received various names, such as Hay Asthma, Pollen Catarrh, Summer Catarrh, and Rose Catarrh, according as the most prominent symptoms, or the supposed cause in a particular case, has been made the basis of nomenclature, and I have thought it convenient to make use of the one most commonly employed in this country.

The disease may be *defined* to be *a peculiar affection of the mucous membrane of the nose, eyes, and air-passages, giving rise to catarrh and asthma, almost invariably caused by the action of the pollen of grasses and flowers, and therefore prevalent only when they are in blossom.*

The *history* of the affection is interesting in many respects, and appears to show either that the complaint, like influenza and cholera, did not occur in Europe in the "good old times," or that the disease was entirely overlooked till a comparatively recent period.

The circumstance, already referred to, that the complaint does not actually kill, and the fact that in its different forms hay fever resembles some other complaint, tend to support the theory that the older physicians may not have observed this transitory affection ; but, on the other hand, the fact that

it has certainly become more common in the last few years points to the probability that irritating properties have been newly acquired by certain vegetable bodies, and that a peculiar idiosyncrasy has been developed.

The first detailed account of hay fever was given by Bostock,¹ who, in 1819, described a "periodical affection of the eyes and chest," from which he was himself a sufferer. In 1828² this physician published some further observations of the complaint, under the name of "summer catarrh." A short paper on hay asthma, by Gordon,³ appeared in 1829, and in 1831 Elliotson⁴ gave a brief description of the complaint. A few years later the same physician⁵ discussed the subject more fully, and with characteristic sagacity pointed to pollen as the probable cause of the affection.

A systematic inquiry into all the circumstances of the disease was made in 1862 by Phœbus,⁶ of Giessen, whose own personal observation was, however, confined to a single case. Unlike most of the other writers upon the subject, moreover, he did not himself suffer from the complaint. His method consisted in issuing circulars and advertisements inviting medical men all over the world to send him answers to a series of questions so framed as to embrace every possible kind of information about the causes, symptoms, and progress of the disorder; its periods of prevalence, geographical and ethnological distribution; and its prevention and treatment. In this manner a vast quantity of facts and observations was collected, and from these Phœbus endeavoured to extract a complete theory of the disease. During the ensuing ten years pamphlets on hay fever were published by Abbott

¹ "Med.-Chir. Trans." London, 1819, vol. x. pt. i. p. 161, et seq.

² Ibid. vol. xiv. pt. ii. p. 437, et seq.

³ "London Med. Gazette." 1829, vol. iv. p. 266.

⁴ Ibid. 1831, vol. viii. p. 411, et seq.

⁵ "Lectures on the Theory and Practice of Medicine." London, 1839, pp. 516—527.

⁶ "Der typische Frühsommer-Katarrh." Giessen, 1862.

Smith,¹ Pirrie,² and Moore,³ dealing with the disorder from various points of view, but all, more or less, showing a disposition to limit the cause of its development to emanations from plants.

In 1869 a theory of hay fever was propounded by Helmholtz,⁴ who was himself a sufferer from the complaint. He held that the symptoms were produced by vibrios, which, although existing in the nasal fossæ and sinuses at other times, were excited to activity by summer heat. He professed to have found a ready means of relief and even of prevention in the injection of quinine, which Binz had shortly before shown to be poisonous to infusoria. Subsequent experience has not confirmed Helmholtz's conclusions. In the following year a short practical paper was written by Roberts,⁵ in which he claimed to have been the first to observe that excessive coldness of the tip of the nose is "*the* pathognomonic" symptom of hay fever, and desired to have due credit awarded for this remarkable discovery! In 1872 Morrill Wyman⁶ discussed the disease as it prevails in America, and tried to establish that two distinct forms of the complaint exist in that country—one occurring in May and June and corresponding to English hay fever, and a later variety peculiar to America, which he called "Autumnal Catarrh." In 1873 Blackley,⁷ of Manchester, produced a work which is a model of scientific investigation. By a most ingenious and carefully-conducted series of experiments he proved that in his own person at least the pollen of grasses and flowers was the sole cause of hay fever, and that in the case of two other patients the severity of the disease bore a direct relation to the amount of pollen

¹ "Observations on Hay-Fever." London, 1865, 2nd ed.

² "Hay-Asthma." London, 1867.

³ "Hay-Fever." London, 1869.

⁴ Binz: "Virchow's Archiv." February, 1869.

⁵ "New York Med. Gaz." Oct. 8, 1870.

⁶ "Autumnal Catarrh." New York, 1872.

⁷ "Hay-Fever." London, 1873, and 2nd ed. 1880

in the air. His subsequent observations make it extremely probable, indeed almost certain, that though transient irritation of the mucous membrane may occasionally be caused by simple dust, pollen is in fact the true *materies morbi* of summer catarrh. In 1876 a short treatise was published by Beard,¹ of New York, in which he dealt with the complaint as it is met with in the United States. His information was collected chiefly by circulars after the manner of Phœbus, but more fortunate than that observer, Beard had himself seen and treated many cases. He received replies from over two hundred patients, and on these data he came to the conclusion that the immediate exciting causes are more than thirty in number, and that further investigations may extend the number of secondary causes to fifty or even a hundred. Beard showed clearly from his statistics that a large proportion of the sufferers are of nervous temperament, and that nerve-tonics are of considerable value in the treatment of the affection. In 1877 an essay was published by Marsh,² in which he completely accepts the pollen theory. The influence of a morbid condition of the nasal mucous membrane in favouring the development of hay fever has been recently insisted on by Daly,³ Roe,⁴ and Hack.⁵

In accordance with the usual method of dealing with *Etiology*, the causes of hay fever may be conveniently divided into the predisposing and the exciting.

The predisposing cause of the complaint is the possession of a peculiar idiosyncrasy, but on what that idiosyncrasy⁶ depends is quite unknown. Whether it is due to

¹ "Hay-Fever, or Summer Catarrh." New York, 1876.

² "Hay-Fever, or Pollen-poisoning." Read before the New Jersey Medical Society, 1877.

³ "Archives of Laryngology." 1882, vol. iii. p. 157.

⁴ "New York Med. Journ." May 12, 1883.

⁵ "Wien. med. Wochenschrift." 1882-83.

⁶ In this respect the idiosyncrasy is like idiosyncrasies in general. The existence of these personal peculiarities is too well known to require much

some local abnormality affecting the structure of the mucous membrane, the capillaries, or the periphery of the nerves, but of too delicate a nature to admit of detection by available methods of research, cannot be determined. The fact, however, remains, that whilst millions of people are exposed to the cause of the affection very few actually suffer from it. The idiosyncrasy is generally suddenly developed without apparent reason. Once acquired, however, it is seldom lost, the predisposition, on the contrary, seeming rather to increase with each recurring summer. The circumstances which are supposed to influence this idiosyncrasy are *race, temperament, occupation, education, mode of life, sex, heredity, and age*. These various points may, with advantage, be considered in detail.

The influence of *race* is seen in the fact that it is the English and Americans who are almost the only sufferers from the complaint. In the north of Europe—that is, in Norway, Sweden, and Denmark—it is scarcely ever seen, and it rarely affects the natives of France, Germany, Russia, Italy, or Spain. In Asia and Africa, also, it is only the English who suffer. As far as I have been able to ascertain, the complaint is more common in the south of England than in the north; whilst in the north of Scotland it is very rare. In America it occurs in nearly every State, though diminishing in frequency towards the south. I think it extremely likely that the disorder will be found in Australia and New Zealand, but I am not aware that any cases have yet been reported from those countries. In support of the view that race has an important influence, it may

comment. Many people cannot eat crabs, lobsters, or strawberries without being attacked with urticaria. Others, again, cannot eat mutton or white of egg without being sick. One of the most interesting cases of idiosyncrasy, and peculiarly appropriate to the present subject, inasmuch as it was brought into operation through the nasal mucous membrane, was that of Schiller, to whom the smell of rotten apples was so beneficial that he could not “live or work without it” (Lewes: “Life of Goethe.” London, 1864, 2nd ed. p. 381)

be mentioned that in New York, where hay fever is comparatively common at certain seasons, Dr. Jacobi, whose practice lies largely among Germans, has never met with a case of the disease in a person of that nationality, and that Dr. Chaveau, of the same city, has never observed the complaint among his French compatriots residing there.¹ Beard never heard of a case amongst Indians or negroes, except the instance related by Wyman, in which an Indian child was the subject of the disease.

The nervous temperament has undoubtedly a certain influence in predisposing to hay fever. This, of course, does not mean that all the patients are highly nervous people; some are of nervo-bilious, others of nervo-sanguineous temperament, but nearly all belong to the active, energetic class of so-called nervous organization.

One of the most singular features of this complaint is that it is almost exclusively confined to persons of some *education*, and generally to those of fair social position. In 1879 I had notes of sixty-one cases of hay fever from my private practice, and had seen many others of which I kept no record, whilst amongst my hospital patients I have not met with a single instance of the disease. Of forty-eight cases which came more or less directly under the notice of Blackley, every one belonged to the educated classes; whilst out of fifty-five cases reported by Wyman, in forty-nine the patients were educated people. Merriman² also says that the affection belongs "principally to the upper and middle classes." The influence of the *mode of life* is shown in the fact that the rustic is much less subject to the affection than the citizen. Thus farmers and agricultural labourers, who of all people are most exposed to the disease, very rarely suffer from it, there having been only seven cases among the two hundred reports collected

¹ Beard: Op. cit. pp. 90, 91.

² "Brit. Med. Journ." 1883, vol. i. p. 1315.

by Beard. It is not possible to say whether the villager owes his exemption to the vigorous health maintained by an outdoor life, or whether habitual exposure to the cause of the complaint begets tolerance ; but the fact remains, that dwellers in towns are much more prone to the affection than those who live in the country.

Sex has a distinct influence, many more men than women suffering from the disease. Out of a grand total of 433 cases cited by Phœbus, Wyman, and Beard, only 142, or about a third, were females. Against these statistics it may be urged that the information on which they are based was collected by circulars, to which, perhaps, women would be less likely to reply than men. This objection, however, does not apply to my own cases, amongst which I met with thirty-eight belonging to the male and only twenty-three to the female sex.

Heredity has likewise a powerful influence. This has been abundantly proved by Wyman and Beard, and it is supported by my own observations. In Wyman's experience there was heredity in 20 per cent., and in Beard's in 33 per cent. Out of my sixty-one cases, in twenty-seven one or more near relatives had suffered in the previous generation. I have also several times treated a father and his children at the same time.

Age to some extent governs the disorder, which in the great majority of cases appears before forty ; but several instances have been reported of the first occurrence of the malady in patients as old as sixty. It is somewhat rare for this affection to show itself in very young children, but I have seen it in one patient at two years of age, and in another at three. In these cases, as in all those of very young patients that have come under my notice, the little sufferers were the children of parents who had themselves been victims to the complaint. Had not the parents been subject to the affection, it is most likely that the true import of the symptoms would not have been recognized in the children, but would have been attributed

to a common cold, and from this it may be inferred that when the complaint attacks the young it is often overlooked.

Many agencies of various kinds have been looked upon as the *exciting causes* of this disease, but there can now be little doubt that *pollen is the essential factor in the case of those who possess the peculiar predisposition*. Before, however, proceeding to show that pollen is the real cause of the affection, it may be well to pass in review some of the other sources to which its origin has been attributed. The most important of these are heat, light, dust, benzoic acid, coumarin, excess of ozone, and over-exertion or several of these influences in combination.

Heat.—Popular observation had already associated hay fever with effluvia from grass or hay, at the time when Bostock, from his own personal experience, put forth the view that the affection is due to the influence of solar heat. The obvious difficulties in the way of this theory led Phœbus to attribute the affection to "*the first heat of summer*," which, he observed, "is a stronger cause than all the grass emanations put together." Later on, however, Phœbus remarked that the "first heat of summer only acts in an indirect manner as an exciting cause;" and he admitted that hay and the blossom of rye cause exacerbations. Heat alone will not, however, produce the disease. It is not met with in the plains of India when the heat is greatest, though occasionally it is seen in the cooler months, before the vegetation is burnt up. Hay fever is also found in the milder climate of the Indian hills, when the grasses and cereals are in blossom. The intense heat of the desert does not produce the disease, nor does it occur at sea in the sultry equatorial regions, though the heat, when vessels are becalmed, is sometimes almost beyond endurance. In America, hay fever is much more common in autumn than in the tropical summer of that country.

Light.—The observations as regards heat apply equally to light. Phœbus thought that the *longer days*, which produce

a more continuous action of light, are perhaps to blame ; but where the light is strongest and lasts longest, indeed in the land of "the midnight sun," hay fever is almost unknown. At sea, when the sun is bright, it is well known that nothing can exceed the glare ; yet a sea-voyage is the best safeguard for the sufferer from hay fever. Persons with a sensitive mucous membrane, especially those subject to hay fever, are no doubt sometimes liable to attacks of sneezing from sunlight, and incautious observers might mistake these symptoms for true hay fever. Some of Beard's patients even attributed the affection to gas-light, but gas-light is used much more in winter when hay fever is absent, than in the English summer and American autumn, when the affection prevails.

Dust.—This is a more difficult subject to dispose of. Most writers who accept dust as a cause of summer catarrh, speak of "common dust," but as Blackley remarks, there is no such thing as *common* dust. The constitution of dust depends upon the geological character of the soil, upon the vegetation which it supports, and on the season of the year as well as on "the number and kind of germs and other organic bodies" present in the atmosphere. Beard's statistics, if accepted without consideration, strongly point to dust as the most common cause of hay fever, for out of 198 patients no less than 104 attributed the affection to dust. Of these 198 cases, however, 142 occurred between May and September ; and it may well be asked : How was it that dust did not affect these patients in the winter months ? Does this not clearly point to the presence in the dust of some special irritant during the summer and autumn months, which does not exist at other times ? In England, in the months of February, March, and April, when strong east winds often blow clouds of dust against the face, symptoms of hay fever do not appear, whilst in June and July, when there is comparatively little dust, hay fever attacks its victims. It is true that in many of Beard's cases, collected by circulars, the patients attributed

the affection to "indoor dust," and some even to "cinders." But as people stay in the house more in winter than in the autumn and summer, and use fires at that time, these agencies, if of any real power, would produce their greatest effect in winter. Directly the opposite, however, occurs. Is it not highly probable, therefore, that these patients were misled as to the real cause of their malady? We all know how easy it is for the trained physician to make erroneous observations and to overlook important physical signs, and how much more likely is the untutored patient to make a mistake in the obscure and highly complicated problems of etiology!

Ozone, Benzoic Acid, &c.—An excess of ozone in the atmosphere was suggested by Phœbus as a possible cause of hay fever, but Blackley purposely breathed air highly charged with this substance for five or six hours without effect. He, moreover, inhaled artificially prepared ozone, in quantities far exceeding what is ever found in the same volume of atmospheric air, without feeling any inconvenience. The same physician also studied the effects on his own person of benzoic acid,¹ coumarin (the odorous principle of many flowering grasses), and of the volatile oils which impart to many plants, such as peppermint, juniper, rosemary, and lavender, their characteristic perfume. The results were in all these cases entirely negative.

Over-exertion, or prolonged exercise, in the open air, never has any effect in cold weather, or indeed at any other time except when grass is in flower. Its influence, however, in *aggravating* hay fever, in the hay season, is very great, and will presently be considered.

Combined Causes of Hay Fever.—Several writers have contended that although any one of the above causes may not

¹ This substance has been shown by Vogel to be contained in *anthoxanthum odoratum* and *holcus odoratus*, the two species of flowering grasses to which the causation of hay fever has been in a special manner attributed.

alone be sufficient to produce hay fever, several of them acting together may be able to do so. Such theories are the last resource of those who are unable to discover the true etiology, and there is not a tittle of evidence in their support.

Having shown what does *not* generate hay fever, its real mode of origin must now be demonstrated.

Blackley's observations leave no doubt that the cause of hay fever is *the action of pollen on the mucous membrane*. His experiments were framed on a most comprehensive plan, and carried out in a rigorously scientific spirit. By well devised tests he succeeded in proving—1st, that in his own person the inhalation of pollen always produced the characteristic symptoms of hay fever; 2ndly, that in his own case, and in that of two other persons, there was a direct relation between the intensity of the symptoms and the amount of pollen floating in the air; and 3rdly, as already shown, that none of the other agents referred to, such as heat, light, dust, odours, or ozone, can of themselves cause the complaint.

Blackley's experiments were made with pollen of various grasses and cereals, and with that of plants belonging to thirty-five other natural orders.

The grasses which, as already stated, were at one time considered to be especially active are the *anthoxanthum odoratum* and the *holcus odoratus*, but this idea no doubt originated in the extremely fragrant odour of these plants, and there is no reason to suppose that their pollen is more active than that of the *alopecurus pratensis*, and the various *poæ* and *loliæ*. The pollen of rye is, however, more potent than some of these, and that of wheat, oats, and barley is also very active. The careful observations of Blackley show that in England, during the season of hay fever, 95 per cent. of the pollen contained in the atmosphere belongs to the *graminaceæ*. This order generally comes into full

blossom between *the end of May and the latter part of July*, and that is precisely the period of the year when hay fever prevails. If the season be wet and cold the disease usually sets in rather later, and is milder in character than when the weather is fine, and the vegetation luxuriant.

There are persons in whom the presence of roses will give rise to an attack, and in America the affection is sometimes called "rose fever." No doubt it is the pollen of the rose which is the active agent. The celebrated Broussais¹ appears to have been impeded in his botanical studies by this idiosyncrasy, whilst the case related by Hünerswolff² of a man in whom the perfume of roses invariably produced an attack of coryza, has been often cited by modern writers. I have myself met with a similar instance. A lady living in Devonshire consulted me in 1864, on account of constant severe coryza, which came on whenever she smelt a rose. All treatment proved futile, and she was ultimately obliged to banish these flowers from her garden.

In America the pollen of the Roman wormwood (*ambrosia artemisiæfolia*) appears to be the most common cause of hay fever. This plant (which belongs to the genus *ambrosiaceæ*, order *compositæ*) is not met with in Europe, but is extremely common in nearly every part of the United States. Wyman³ found that when a parcel containing this plant was opened at White Mountain Glen, where he had retired, in order to avoid hay fever, he and his son were immediately attacked with all the symptoms of the malady. *The plant blossoms in August and September, and it is then that hay fever most prevails in America.* Several varieties of the *artemisiæ*, a closely-allied genus, are met with in England, and I think it not improbable that some cases of hay fever which have occurred at the seaside in

¹ Anglada : "Du Coryza simple." Thèse de Paris, 1837, p. 14.

² "Ephem. Nat. Curios," dec. ii. ann. v. obs. xxii.

³ Op. cit. p. 101.

this country may have been due to the pollen of the *artemisia maritima*, or its variety, *artemisia gallica*. It is curious that, except in the case of Indian corn, the pollen of *grasses* appears to have but slight effect in America, though a mild form of hay fever is met with in that country from May to August.

There are certain supposed fallacies in the pollen theory which must be referred to. Thus a case is mentioned by Walshe,¹ in which the patient retained the symptoms of hay fever during a passage across the Atlantic, and another has been reported by Abbott Smith,² in which the disease came on at a distance of nine miles from land. These are, I believe, the only authentic instances in which hay fever has continued to exist, or has originated at sea, and they are open to various explanations. It has been distinctly shown by Blackley that pollen may be retained in an article of dress for many weeks, and in Smith's case, the patient, who was yachting, experienced the symptoms after assisting "to hoist the sails." The attack came on on the 13th of June, and it is not unlikely that when the sails were unfurled a large quantity of pollen collected in their folds was set free. In Walshe's case, the symptoms may have been kept up by some other irritant to which the patient may have had a peculiar susceptibility, or the case may not have been a true example of hay fever, but of ordinary asthma, complicated with catarrh. It is not altogether impossible, however, that pollen may be deposited on a ship miles away from land. Darwin³ has shown that dust is sometimes carried by the wind far out over the Atlantic. "The dust," he observes, "falls in such quantity as to dirty every thing on board and to hurt people's eyes; vessels have even

¹ "A Practical Treatise on Diseases of the Lungs." London, 1871, 4th ed. p. 228.

² "On Hay Fever." London, 1866, 4th ed.

³ "Journal of Researches, &c." London, 1845, 2nd ed. p. 5.

run on shore owing to the obscurity of the atmosphere." Again, in speaking of the distribution of pollen, Darwin reminds us that the ground near St. Louis, in Missouri, has been seen covered with pollen as if it had been sprinkled with sulphur, and there is good reason to believe that this had been transported from the pine forests at least 400 miles to the south.¹ A shower of yellow pollen was wafted to Philadelphia² from some distant pine forest so recently as the 16th of March (1883). It caused such a thick deposit as to lead ignorant people to take it for brimstone. These facts are sufficient to show that the influence of pollen may be experienced under circumstances where it would not generally be looked for.

Whilst asserting that pollen is the universal cause of the peculiar form of catarrh known as hay fever, I do not mean to deny that other irritating particles might produce a similar complaint if persistently brought in contact with the mucous membrane. Thus, it is well known that powdered ipecacuanha will in some persons cause a peculiar form of asthma closely resembling hay asthma, and with many people the fumes of burning sulphur have the same effect. I have frequently observed slight attacks resembling hay fever produced by the insufflation into the larynx of powdered lycopodium, and, indeed, I have for this reason been compelled to give up the use of this drug as a diluent for medicinal powders. Some people experience symptoms somewhat analogous to those of hay fever from smelling certain fruits, whilst others are troubled in the same way by the presence of cats, rabbits, and guinea-pigs, and Bastian³ suffered from an affection closely resembling hay fever whilst he was dissecting the *ascaris megalocephala*, a parasite which

¹ "The Effects of Cross and Self-Fertilization in the Vegetable Kingdom." London, 1876, p. 405.

² "Philadelphia Med. News," April 7th, 1883.

³ "Philosophical Transactions." 1866, vol. cvi.

infests the horse. If the specific exciting influence is kept in operation on a person subject to an idiosyncrasy of this kind, a complaint almost precisely similar to hay fever is produced; but as a rule, the conditions leading to its manifestation are exactly known by the patient, and can therefore be avoided. The etiological peculiarity of hay fever consists partly in the fact that the idiosyncrasy as regards pollen is more common than other individual susceptibilities, but chiefly in the circumstance that at certain seasons pollen exercises its influence over wide areas, and can be excluded only with great difficulty.

In a recently published article, Daly,¹ of Pittsburg, has endeavoured to show that in a large proportion of cases there is an intimate relation between hay asthma and chronic nasal catarrh, and that except when disease of the nasal mucous membrane exists the alleged exciting cause of summer catarrh is inoperative. He reports two cases of thickening of the turbinated bodies, and one of polypus, in which, after the cure of the local condition, the patients lost their susceptibility to hay fever. These persons had suffered from summer catarrh for twenty-one, fifteen, and six years respectively. Roe² and Hack³ have since enunciated similar views to those propounded by Daly. It is not at all unlikely that an unhealthy state of the mucous membrane of the nasal fossæ may predispose to hay fever, but I may remark that I have repeatedly examined the interior of the nose in cases of hay fever without finding anything more than general congestion.

The *symptoms* of the disease are seen under two well-marked types, the catarrhal and the asthmatic. In the former the onset is very sudden, the patient becoming conscious of an itching, smarting sensation in the nose and eyes, and sometimes in the fauces and roof of the mouth. Not unfrequently the attack commences with a feeling of

¹ "Archives of Laryngology." 1882, vol. iii. No. 2. ² Loc. cit. ³ Loc. cit.

extreme irritation at the inner canthi. Paroxysms of sneezing, often of extreme violence, quickly ensue, followed by an abundant thin discharge from the nose. The mucous membrane of the nasal fossæ swells so as to block up the passages and make respiration through them impossible. At the same time there is profuse lachrymation with much pricking and stinging of the conjunctival surfaces, and sometimes photophobia. There is often a certain amount of chemosis, and occasionally the eyelids become puffed so as almost to close the eyes. The discharge from both nose and eyes gradually grows thicker, sometimes even becoming semi-purulent in character. There may be severe neuralgic pain in the eyeballs and over the back of the head. Now and then there is some degree of pyrexia, but this is by no means the rule. The disorder often varies considerably in intensity, even in the same person, within short intervals of time, so as almost to give an intermittent character to the complaint. This is probably due to the varying quantity of pollen present in the atmosphere, the severity of the disease being, as a rule, in direct proportion to the abundance of the *materies morbi*. An attack lasts from a few hours to several days, or even longer, finally ceasing almost as suddenly as it set in, and leaving little or no trace of its presence either in local lesion or systemic disturbance. In some patients hay fever is accompanied by nettle-rash.

The asthmatic form of the complaint may be superadded to the disorder just described, or it may constitute the entire affection. It generally comes on in the day-time, and the paroxysm may pass off in a few hours, the patient first expectorating a little ropy mucus and later an abundant frothy secretion, or the dyspnœa may continue with only a slight remission, as long as the sufferer is exposed to the influence of pollen. The attacks seldom produce any emphysema, and the patient sooner or later entirely recovers.

The *diagnosis* of hay fever from common catarrh on the one hand, and spasmodic asthma on the other, is not always easy, and mistakes in diagnosis were formerly very common; but the disease is now so much better known that errors are less likely to occur. The first attack might perhaps be confounded with ordinary coryza; but the suddenness of the onset, the characteristic œdematous puffiness of the eyelids, together with the absence of constitutional symptoms, will speedily lead to a truer diagnosis. People who are prone to catarrh are very apt to catch cold in the changeable weather of the spring and early summer of this country, and these cases are sometimes mistaken for hay fever; but the readiness with which they yield to anti-catarrhal treatment at once shows their real nature.

The asthmatic form of hay fever may, in some instances, be less easy to recognize; but the history of the case will generally guide the practitioner to a correct opinion. The fact that hay fever comes on, as a rule, in the day-time, out of doors, and in the summer, whilst, on the other hand, paroxysms of true asthma most frequently occur in the evening or night, indoors, and in one of the other seasons of the year, may help to differentiate the two complaints.

The *prognosis* is in all cases favourable as regards the termination of each attack: *cessante causâ, cessat effectus*. When the season of flowering grass is past the complaint will certainly depart; but it will almost as surely reappear whenever the patient is again exposed to the action of pollen.

Hay fever leaves no permanent structural lesion behind it, and cannot therefore be said to have any *pathology*. Blackley thinks that pollen has a peculiar and specific effect in causing dilatation of the capillaries and exudation of serum from them; but it appears to me highly doubtful whether this is anything more than the reaction which ordinarily follows the application of an irritant.

It need scarcely be said that zealous "bacteriomanics"

have, of course, sought for parasitic germs in the nasal secretions of those subject to hay fever; but although bodies resembling pollen-corpuscles have been found,¹ no specific organisms have, so far as I am aware, been detected. It is almost a comfort in these days to find one disease for which the ubiquitous bacillus does not appear to be responsible.

The *treatment* of hay fever is by no means satisfactory, and in no disease is the old adage, that "prevention is better than cure," more truly applicable than in the case of this complaint. If the poison be continually introduced into the system, the antidote, if one exists, can have but little chance of effecting a cure. The first measure, therefore, must be to remove the patient from a district in which there is much flowering grass. A sea-voyage is probably the most perfectly satisfactory step that can be taken. Patients who are unable to go to sea should endeavour to reside on the coast, where they will generally be free from their troublesome complaint, except when land-breezes blow. Dwellers in towns should avoid the country, and those who reside in the country should make a temporary stay in the centre of a large town. It often happens, however, that such a change of abode is not practicable, and under such circumstances, if the complaint is very severe, the patient should, if possible, remain indoors during the whole of the hay season. Many persons, of course, cannot keep to the house during the month or six weeks of the hay fever period; and those who can, are apt to find such detention not only exceedingly irksome but very injurious to the general health. If, therefore, a patient is obliged to go out of doors he should plug his nostrils with cotton-wool or wadding by means of one of Gottstein's screws, and should defend his eyes by wearing spectacles with large frames, accurately adapted to the

¹ "Brit. Med. Journ." 1881, vol. ii. p. 18.

circumference of the orbits.¹ Plugging the lachrymal ducts with small glass rods has also been recommended,² and Thorowgood speaks³ favourably of a little apparatus containing a few drops of a camphorated or carbolized solution, which can be comfortably worn in the nostrils. Instead of *plugging* the nose, it has been advised⁴ to *close* it by compression with a little metal clip. As rapid motion in the open air almost always aggravates the complaint, it may be advantageous to wear a veil over the face whilst driving. One made of "three ply" of fine silk gauze has been found very useful.⁵ It is recommended that for men it should be made in the form of a bag open at both ends, one end fitting round the hat whilst the other has attached to it a heavy wire ring about ten inches in diameter, which lies on the shoulders and keeps the veil off the face. Those who do not mind being occasionally mistaken for the "veiled prophet of Khorassan" will no doubt adopt this plan. Protected in this way, many people predisposed to hay fever escape altogether, whilst others contract the affection in a very mild form.

As the disease most commonly occurs in persons of nervous temperament, nerve-tonics and other constitutional remedies have been used for the purpose of warding off hay fever, or controlling the violence of its attacks. Amongst these, quinine, arsenic, opium, and belladonna have been employed, but I have found valerianate of zinc, in combination with assafoetida, more valuable than any other drug. I usually give the remedy in the form of pills containing one grain of valerianate of zinc, and two grains of the compound assafoetida pill, doubling the dose at the end of ten days or a fortnight. I

¹ Both the screw and the spectacles are sold by Messrs. Mayer and Meltzer, Great Portland Street.

² Hannay: "Brit. Med. Journ." 1881, vol. ii. p. 872.

³ "Lancet." 1881, vol. ii. p. 82.

⁴ Hannay: loc. cit.

⁵ "Brit. Med. Journ." 1883, June 30.

direct my patients to begin taking these pills as the hay season approaches, and under the use of this remedy, many persons who formerly suffered most severely from hay fever have ceased to be troubled with it.

When the disease is established, tincture of opium is of great benefit in controlling hay asthma, reducing the secretion, diminishing the sneezing, and at the same time bracing up the nervous system. It should be given in small doses of five or seven drops twice daily, and a saline purgative should be taken on alternate mornings. Belladonna has been recommended, but I have had no experience of its use in this complaint.

I trust very little to local measures in the treatment of hay fever, but when there is profuse secretion with an excessive tendency to sneeze, the inhalation of strong ammonia salts often gives great relief. I have not found injections of quinine, as recommended by Helmholtz, at all useful. Though in a few cases benefit was derived, in most instances no effect was produced, whilst some patients were actually made worse. The good effect is probably to be explained by the injection washing away the *corpus delicti* mechanically rather than by any parasiticide action. The same remark may apply to the case in which Binz¹ states that a solution of one part of salicylic acid to one thousand of water, thrown into the nares, cut short the disease. The Vapor Benzoini of the Throat Hospital Pharmacopœia has occasionally produced a soothing effect, and I have also seen good results from insufflations into the nose of a powder consisting of one-sixteenth of a grain of morphia and one grain of bismuth. This should be applied several times a day. Ferrier's snuff may be substituted for the above formula, but it should be applied by insufflation. It is also said² that great advantage has been derived from the snuffing of pure salicylic acid, ten or fifteen

¹ "Deutsche med. Wochenschr." Sept. 22, 1877.

² "Brit. Med. Journ." 1878, vol. ii. p. 101.

grains being used in this manner in the course of the day. As, however, this powder is highly irritating to the mucous membrane, I am inclined to believe that most persons would consider the remedy worse than the disease.

In a few cases I have known some benefit result from the use of medicated bougies, such as the bismuth, and acetate of lead Buginaria of the Throat Hospital Pharmacopœia ; but, like quinine-spray, they occasionally aggravate the mischief they are meant to cure.

The upper lip and the margins of the nostrils should be smeared over with benzoated zinc ointment two or three times a day, when those parts are inflamed, or aconite liniment¹ may be used in the same way.

For the relief of the irritation of the eyes, frequent bathing with very cold water is sometimes useful, though Roberts² appears to have found more benefit from warm and slightly salt water. Sulphate of copper (gr. ij. ad ℥j.) or sulphate of zinc (gr. ij. ad ℥j.) may sometimes do good, but I have found a lotion containing two grains of acetate of lead with two drops of dilute acetic acid in an ounce of water, the most soothing application. Sedative collyria occasionally allay the irritation ; for this purpose a small quantity of a solution of acetate of morphia (gr. j. to iij. ad ℥j.) may be dropped into the eyes when they begin to itch.

Asthmatic patients are often relieved by inhaling the fumes of nitrated blotting paper, the good effect of which is further increased by steeping the paper in a solution of stramonium, datura tatula, belladonna, or lobelia. A patent American remedy, consisting of nitrate of potash and powdered herbs of which stramonium or datura tatula is probably the most important, is sold under the name of "Himrod's Cure,"³ and

¹ Ringer : "Handbook of Therapeutics." London, 1880, 8th ed. p. 288.

² "New York Med. Gaz." Oct. 8, 1870.

³ The original formula of this remedy has recently been published in one of the pharmaceutical journals. It is said to consist of stramonium, lobelia

when this powder is lighted and the fumes inhaled, they sometimes quickly relieve the spasm.

In hay fever the food should be nutritious and easily digestible. Owing to the depression which the complaint causes, stimulants are sometimes necessary, but they should, if possible, be avoided, or only taken in small quantities. Light claret or hock or whisky diluted with water are the least injurious. Tea and coffee are extremely useful in the asthmatic form of the disease, both in relieving the spasm and counteracting the exhaustion which follows it. Thorowgood¹ strongly recommends citrate of caffeine for the same purpose, especially in cases where the heart is weak; he gives it in doses of two or three grains dissolved in water or warm coffee.

inflata, black tea, and nitre in equal parts. If a little powdered aniseed or fennel be added to this preparation, it certainly produces a compound which in appearance and effect is very similar to that of Himrod's remedy. Careful microscopical examination made at my request by those familiar with vegetable structures has, however, failed to detect any tea leaf in Himrod's preparation, though, of course, it is readily seen in specimens of powder prepared according to the formula just given. On the other hand, bearing in mind the fact mentioned in the text, that tea when drank often gives great relief to asthmatics, it is not at all improbable that the herb may have some effect, if burnt and inhaled.

¹ "Lancet." 1881, vol. ii. p. 83.

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